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China's Program To Renovate Traditional Industries: Limited Dividends Thus Far

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A Research Paper

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A Research Paper

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China's Program To Renovate Traditional Industries: Limited Dividends Thus Far

Summary

Information available as of 15 August 1988 was used in this report.

For the past decade Beijing has carried out a program to upgrade industrial technology to remedy shortcomings in traditional industries such as machine building, chemicals, and textiles—the mainstays of China's industrial production. China initially relied heavily on massive imports to support new plant construction, but it subsequently focused on renovating existing plants, particularly the large- and medium-sized enterprises that account for over two-thirds of China's fixed assets and tax revenues.

Although China's state-owned enterprises have invested $170 billion in technological renovation and capital construction in the last 10 years, technical levels generally remain low. Only 10 percent of large- and medium-sized enterprises have upgraded equipment, and performance has lagged Chinese expectations in machine building, raw materials, and energy. The technical transformation program has had selected successes, such as in textiles and light industry, and Chinese officials generally credit the program with increases in overall industrial capacity and output.

Budget constraints are increasingly forcing Beijing to seek more frugal approaches to upgrading industrial technology. Enterprises are being encouraged to fund new technology purchases by using their retained earnings and by tapping new funding sources such as domestic loans, foreign capital, bond sales, shareholding, and leasing. China is also increasingly willing to import secondhand equipment and has introduced mechanisms to recycle unused or underutilized machinery.

We believe that by focusing on the financial aspects of technical renovation Beijing is ignoring other significant obstacles—in particular poorly coordinated investment and weak indigenous technical capabilities. Measures to improve project appraisals and monitor expenditures will not eliminate misuse of funds. Also, China's use of microelectronics to upgrade machinery is hampered by the continuing difficulties in manufacturing and using advanced equipment.

China will continue to increase industrial output and improve quality and productivity, but results will be uneven. Sectors such as textiles that have a good start on introducing technology are best situated to improve performance, including increasing exports. Similarly, machine building, petroleum, and some segments of the chemical industry will further progress

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through technical upgrading, while progress in renovating the power industry will depend partially on efforts to increase investment. Sectors such as plastics that have had little success are likely to remain backward, with negative implications for China's plans to improve the packaging industry in support of its export drive.

Finally, China's inability to rapidly upgrade industry may limit reform efforts:

- In the absence of technological upgrading, the contract system and similar managerial innovations are likely to have limited, one-time benefits. The contract system also could work against technological upgrading if contract terms fail to give managers adequate incentives for undertaking renovation.

- Under the coastal development strategy, China is counting on exports from coastal provinces to generate foreign exchange to pay for needed imports. But the technical levels of enterprises in coastal areas—though generally better than elsewhere—are still low, and in many cases will limit export-led growth.

- The slow pace of renovating traditional industries hampers overall economic development, as shortages of raw materials and energy limit industrial output, and state subsidies to technically backward enterprises drain the budget.

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China's Technological Transformation Program

What Is Technological Transformation? *Upgrading technology and equipment in enterprises to improve efficiency, output, products, and profits. China has increasingly tried to focus on expansion and reconstruction of existing facilities, although new construction continues as well. Although the terms technological renovation and transformation are used interchangeably, the broader concept of technological transformation also includes quality control, standardization, patents, and information exchange.*

Where Is the Technology From? *From both advanced foreign and domestic innovations. China has imported over $13 billion worth of technology to support industrial transformation (see figure 2). Indigenous technology is being promoted by reforms encouraging greater cooperation between research institutes and factories, between universities and industry, and between military and civilian research and production units.*

How Is It Funded? *State budget allotments, state loans, and funds raised by enterprises—including bank loans, foreign capital, and other measures. Although total investment in technical renovation has risen, state allotments have decreased from 18 percent of technical renovation funds in 1980 to only 3 percent in 1986, with state loans and enterprises making up the difference.*

Who's Involved? *Central government commissions and ministries provide policy planning, oversight, and funding; provincial and local authorities, together with factory management, fund and plan projects and oversee implementation. Foreign firms provide capital and technology. Domestic research institutes also contribute management and technical expertise, as do various information clearinghouses. Beijing sponsors annual national conferences for enterprises to discuss experiences with technological transformation.*

What Sectors Are Being Upgraded? *All sectors. Priorities are currently shifting from light industry and textiles to:*

- *Heavy industry—including machinery, raw and semiprocessed metals, chemicals, building materials, power, petroleum, and coal.*
- *Manufacturing—machine building, metals, cement, chemical fertilizers, and pesticides.*
- *Infrastructure—transport and telecommunications.*

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Modernizing Traditional Industries: Shifting Strategies

For 10 years, industrial modernization has been a key to China's development strategy. In addition to establishing or expanding capabilities in new technical areas such as computers and electronics, China has sought to upgrade traditional industries that serve as the mainstay of its economy. These include machine building, textiles, food processing, chemicals, metals, power, and building materials (see figure 1).

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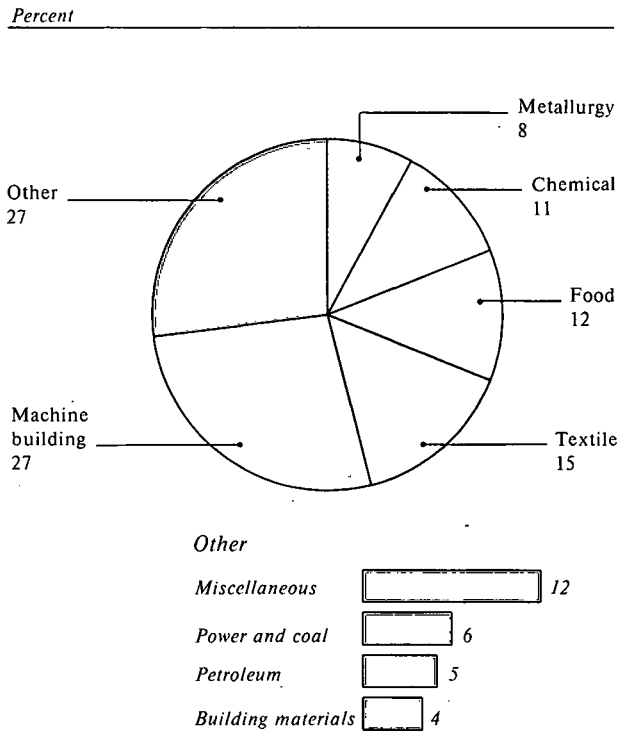
In the late 1970s and early 1980s, imports played the central role in Bejjing's industrial modernization strategy, and the open-door policy allowed an unprecedented burst of foreign equipment purchases to support plant construction and renovation. The difficulties and costs of importing a modern industrial base became obvious quickly, and China began reconsidering its priorities. Beijing increasingly emphasized the need to more effectively use its machinery and technology. The Sixth Five-Year Plan (1981-85), adopted in 1982, increased investment in technical transformation, with the machine-building industry designated a high priority. The Seventh Five-Year Plan (1986-90) further called for cutting back on plant construction and funneling investment into technological renovation of established enterprises, particularly the large- and medium-sized enterprises that are vital to the economy. China's leaders argued that technological renovation of existing plants uses less money and produces quicker returns than new capital construction; they especially criticized the long lead-times and slow returns on investment from large new showcase projects such as the Baoshan Steel Complex. To emphasize the shift in focus to technical transformation, in 1986 the State Planning Commission adopted measures calling for:

- Reduced tax rates to encourage technical transformation projects.
- Strict oversight by banks to ensure the proper use of technological transformation funds.
- Emphasis on projects that improve quality control, conserve energy resources, reduce materials consumption, and increase exports.

Figure 1
China: Gross Industrial Output Value by Industry, 1986



Source: Statistical Yearbook of China.

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The High-Tech Approach

Beijing is particularly emphasizing adding microelectronics technology to enhance productivity in traditional industries. For example, at a national conference in 1986, Li Peng, then Vice Premier and now Premier, stated that the improvement of industrial machinery through incorporation of electronics—especially microcomputers—would largely determine

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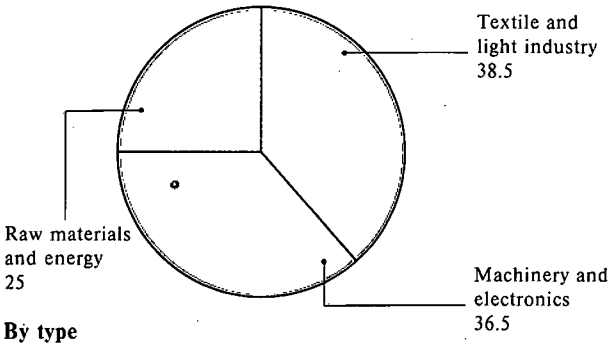
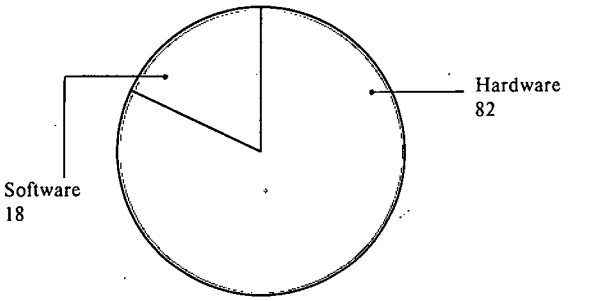
Figure 2
China's Technology Imports, 1979-87

Percent

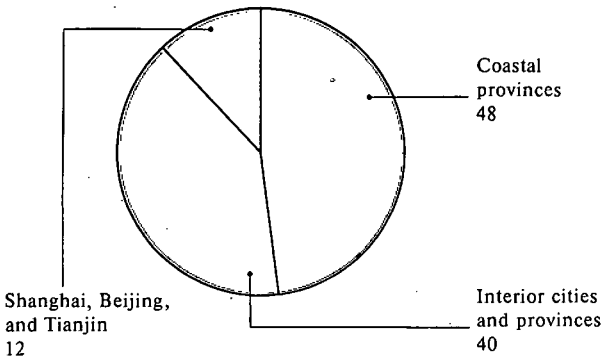
By sector



By type



By region



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the progress of modernization for all other sectors of the economy. The machine-building industry heads the list for computerization because Beijing believes the provision of electronic-controlled machinery will set the pace for the technological upgrading of other sectors such as energy and building materials. Using electronic technology to transform old machine tools, for example, can greatly improve precision and efficiency. 25X1

At the conference, State Economic Commission Chairman Lu Dong announced that:

- All enterprises in machine building and electronics will be required to experiment with computer-assisted production and management before 1990. The machine-building industry is to introduce microcomputers into management at 1,000 enterprises and complete a computer-aided design (CAD) system for 24 major electrical machinery products.

- All technological upgrading projects—as well as all major construction—must include funds for computer facilities. Lu suggested that 3 to 5 percent of technical transformation funds be set aside for computer applications and called for preferential arrangements to reduce costs and tax payments for enterprises experimenting with computerization. 25X1

Chinese universities, research institutes, and enterprises are working on both CAD and computer-aided manufacturing (CAM)—which many Western specialists view as the two most important industrial applications of computers and an important measure of a nation's industrial skill level. CAD applications are more numerous than CAM in China, although computers have been applied to manufacturing—mostly in the form of process-control systems in the chemical, petroleum, metallurgy, and cement industries, or in the use of a single microcomputer or microprocessor to control a piece of equipment. Other applications include development of computer systems for choosing placement of cartons in loading cargo ships, and computerized financial models for machine tool factories. 25X1

The Robotics Controversy: Men or Machines?

China values robots for a variety of civilian and military applications and sees them as an important means of improving quality and safety and of reducing waste. Chinese press articles in mid-1987 said China has developed over 100 models of robots, but only a few have been installed in production facilities. Plans call for the application of 100 robots in industry per year by 1990.

The use of industrial robots and other labor-saving machinery in a country with a large, underutilized labor force is controversial. *the government has yet to make a long-term commitment on robotics. Selected research institutes and universities are working on robotics, and three centrally sponsored test projects are evaluating their use in manufacturing—primarily spot and arc welding, and spray painting applications for automotive and manufactured products. An announcement as to whether China will continue to press applications of robotics in manufacturing was due in mid-1988.*

China's State Science and Technology Commission is also promoting computer-integrated manufacturing (CIM). In November 1987, Chinese officials said they plan to establish a state-of-the-art CIM plant within the next five years and are seeking a US consultant to help with project design and implementation. Depending on the success of this project, Beijing will decide on further funding for CIM technology in 1992-93. metalworking industries will be the exclusive focus of CIM for the next five years.

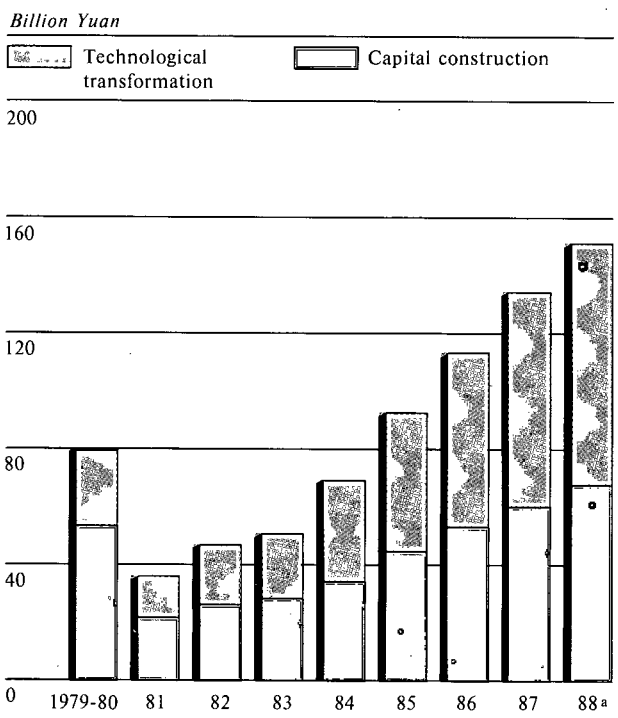
Mixed Results to Date

Despite a decade of effort, and over $84 billion invested in technological renovation and equipment and $86 billion in industrial capital construction by state-owned enterprises (see figure 3), technical levels remain low and too few factories have been upgraded. Of particular concern for Beijing has been the lagging performance in raw materials, energy, and machine building (see inset on page 5), and outmoded technology in larger enterprises. For example, largely through technology transformation, the chemical industry rapidly expanded capabilities to become one of the world's largest producers of chemical fertilizers, but expansion has not been rapid enough to prevent China from remaining one of the largest importers. At the same time, the quality of Chinese industrial plastics remains very poor. As for energy, the electric power industry's inability to meet demands despite continuing increases in production is exacerbated by inefficient transmission equipment and outdated factory equipment that wastes energy. Although only 8,800—or less than 2 percent of China's 499,000 enterprises—count as large- or medium-sized, they account for over two-thirds of fixed assets and tax revenues, and half of output value. According to the Chinese press, most of these enterprises were built in the 1950s and 1960s, but only 10 percent have upgraded equipment. In 1986 such enterprises actually decreased the number of technical renovation projects and the amount of investment, according to one press report.

Although the continued shortcomings often overshadow gains, we believe the technological transformation effort nonetheless is contributing to greater availability, variety, and quality of products from many traditional industrial sectors. The program's greatest successes have come in textiles—now one of the nation's major foreign exchange earners—and light industry. The machine-building industry has improved indigenous production of certain equipment sufficiently to limit imports in these categories, and is slowly expanding exports of machine parts and machinery. broader improvements from technical transformation:

- in general, technological upgrading combined with managerial improvement accounted for 60 percent of the nation's increased output value between 1981 and 1985.

Figure 3
China: Investment in Industry by State-Owned Enterprises, 1979-88



a Estimated.

- Between 1979 and 1987 technological transformation projects created fixed assets worth $57.3 billion,[1] more than one-third of the fixed assets of government-owned enterprises in 1980. For example, technological renovation has created an additional 12 million tons of capacity in the steel industry.

- Instead of only 10 percent a few years ago, nearly 30 percent of China's machinery and electrical products now meet world standards of the late 1970s and early 1980s.

[1] Yuan values have been converted to US dollars at yearly rates as published in IMF International Financial Accounts.

Looking for Solutions

As budget constraints have forced a more realistic appraisal of the state's ability to fund the technological transformation program, Beijing has sought more frugal approaches to renovation: shifting the burden from the state by getting enterprises to fund renovation themselves; using investment and technology more effectively; and providing incentives for both factories and research units to engage in industrial renovation.

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Beijing, for example, is encouraging enterprises to invest their retained earnings in new technology and to tap new sources of funding, including:

- ***Domestic loans.*** The Industrial and Commercial Bank of China, for example, extended nearly $3 billion for technical renovation in 1987.

- ***Foreign capital, through joint ventures and bank loans.*** Li Peng told the Seventh National People's Congress in spring 1987 that enterprises should cooperate more with foreign investors to accelerate technological upgrading. China has received technical transformation loans from international organizations such as the World Bank, the Asian Development Bank, and the UN.

- ***Bond sales.*** Enterprises in Shenyang began the practice of issuing bonds to raise funds for technological upgrading in 1986 and reportedly collected more than $94.6 million by the end of the year. China's High-Tech Venture Company issued the first nationwide financial bonds in April 1988 to raise money for key projects such as construction of energy plants, transportation systems, and technical improvements, according to press reports.

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- ***Shareholding.*** China introduced shareholding—allowing employees to own shares in a company to boost productivity—in 6,000 factories, and press reports call the experiments an effective way to raise money for technological upgrading.

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Machine-Building Industry: A Case Study

Beijing has given priority to the machine-building industry because of its importance to the development of other industrial sectors. The industry encompasses over 100,000 plants and accounts for one-fourth of all industry's workers, output value, fixed assets, profits, and taxes. It produces machine tools, power machinery, and equipment for transportation, metallurgy, construction, mining, petroleum, and agriculture. Structural reforms to improve the performance of the sector have mirrored trends throughout the economy: decentralization of management from central ministries to provincial or local authorities, grouping enterprises into corporations to take advantage of complementarities and reduce redundancies, greater involvement of defense industries in civil production, and, more recently, cooperation with the electronics industry to upgrade capabilities and products.

Both the quantity and quality of Chinese machinery have increased significantly in recent years—largely as a result of foreign technology acquisitions, in our view. For example, China has 20 large-scale comprehensive production plants producing 100 complete sets of coal-mining equipment annually. China in recent years has restricted imports of over 100 types of machinery that authorities believe can be supplied domestically, and has even begun to export some types of machinery.

Nonetheless, domestic production generally is unable to meet demand, in terms either of the quantity or the type of goods needed. Only a small fraction of plants are capable of using modern manufacturing methods for large-series production; of 155,000 machine tools produced in 1985, only 1 percent were manufactured using numerical-control technology that allows greater quality control and efficiency. Similarly, by the end of June 1987, China had managed to reequip only 13,000 machine tools and apply microcomputers to renovate less than 1 percent of the 360,000 industrial furnaces and boilers in the machine-building and metallurgical industries. Product quality remains generally inadequate, with only a low-grade-precision machining capability. In 1985, in fact, Chinese officials announced that imports of machinery and electrical products were $18 billion, almost equal to the total output value of the domestic industry. 25X1

To improve performance, industry officials in May 1987 announced they were revising their plan for the Seventh Five-Year period to improve coordination between departments. Technology imports will continue, but at a slightly lower rate and on a more selective basis, focusing on energy, transportation, raw materials, textiles, and agriculture. Production will also be more selective, such as the call in January 1988 for enterprises to cease production of outmoded textile machinery. Reorganizations—creating a State Machine-Building Commission in 1985, and in 1988 merging the Commission and the Ministry of Electronics into the Ministry of Machine Building and Electronics Industries—may eventually eliminate some redundant personnel and improve manufacturing and marketing skills. 25X1

Other steps to spur development of the machine-building sector include the following: 25X1

- *In August 1987, the State Machine-Building Commission established an office to coordinate production of internal-combustion engines, previously scattered among 14 ministries.* 25X1
- *Beijing is concentrating efforts to develop numerical-control systems by combining the research programs of several enterprises.*
- *Under a March 1988 agreement, the Communications Bank of China will issue loans to help commercialize research achievements related to machine building, provide credits to expand exports, issue bonds or stocks on behalf of enterprises, and help run businesses that lease Chinese and foreign machinery.* 25X1

- ***Defense industry cooperation with civilian industry.*** For example, defense industries in Jiangxi Province have raised more than 70 million yuan over five years for investment in technology in civil enterprises.

- ***Leasing.*** Enterprises are also turning to leasing as a mechanism for financing equipment needs. Since 1981, more than 40 leasing companies have been set up—including 13 Sino-foreign joint ventures—and 1,100 leasing contracts have been signed involving production lines for food, equipment, shoes, and industrial materials. Leasing is particularly useful for smaller plants with enough retained foreign exchange to lease machinery, but not enough to purchase it all at once.

To get the most out of money spent on foreign and domestic equipment, China is trying to recycle unused or underutilized machinery—often a lingering reminder of poor planning that resulted in machinery inappropriate for the intended use, or idled by a lack of servicing, supplementary equipment, or production inputs.[2] The Chinese press reports that up to 10 percent of the country's 400 billion yuan ($107 billion) worth of machinery is idle. One commentary estimated that, if the more than 900 pieces of idle equipment in Wuhan City were put into production, the output value would climb by $32 million and the profit tax remitted to the State by $8 million. Efforts to improve use of machinery include:

- The machine-building industry holds a national fair annually to promote domestic secondhand equipment sales.

- New companies have sprung up in at least six cities to help redistribute idle machinery. The Overstocked Products and Information and Redistribution Center in Beijing, for example, provides information on idle equipment at enterprises throughout China to prospective buyers.

[2] Beijing is also increasingly willing to import secondhand equipment. Since 1983, China has spent more than $250 million on used foreign machinery, instead of spending over $1.2 billion on new machinery, according to statements in the Chinese press.

- In February 1988, the State Economic Commission announced that, under a new program to improve the use of imported technology, 300 products manufactured with imported technology would have priority access to foreign exchange, bank loans, materials, and tax reductions or exemptions. 25X1

China is also instituting financial incentives to encourage all sectors to more rapidly upgrade technology. In April 1987, China announced tax concessions on imports of equipment for technical renovation. To accelerate the renewal of equipment, a new method of calculating depreciation of fixed assets has also been adopted. China's old depreciation rate for equipment and buildings was replaced by a system with categories of rates for different machines and buildings. 25X1
China's average depreciation rate is expected to rise 1 percent, to 5.3 percent, but still lower than the average for the United States (6.4 percent) and Japan (5.9 percent). 25X1

In addition, Beijing is encouraging enterprises to upgrade production by developing a national quality-control system—that rewards product improvements by improved access to raw materials, manager bonuses, and quality certificates to aid in marketing products. The patent system is reportedly being strengthened to protect such industrial innovations. To overcome the lack of technical expertise within industry, Beijing is providing salary incentives to urge technical personnel to transfer to industry, is cutting state research funding to force research institutes to seek industrial projects, and has announced that research institutes will be required to merge with businesses by 1990. One press account suggested that over 42,000 cooperative ventures between enterprises and research institutes or universities were established by November 1987. 25X1

Unresolved Problems Dim Prospects

We believe that, by focusing on the financial aspects of technical renovation, China is ignoring significant obstacles. Beijing thus risks repeating the mistakes of the late 1970s, when it tried to "buy modernization" without recognizing general economic conditions and infrastructural constraints. 25X1

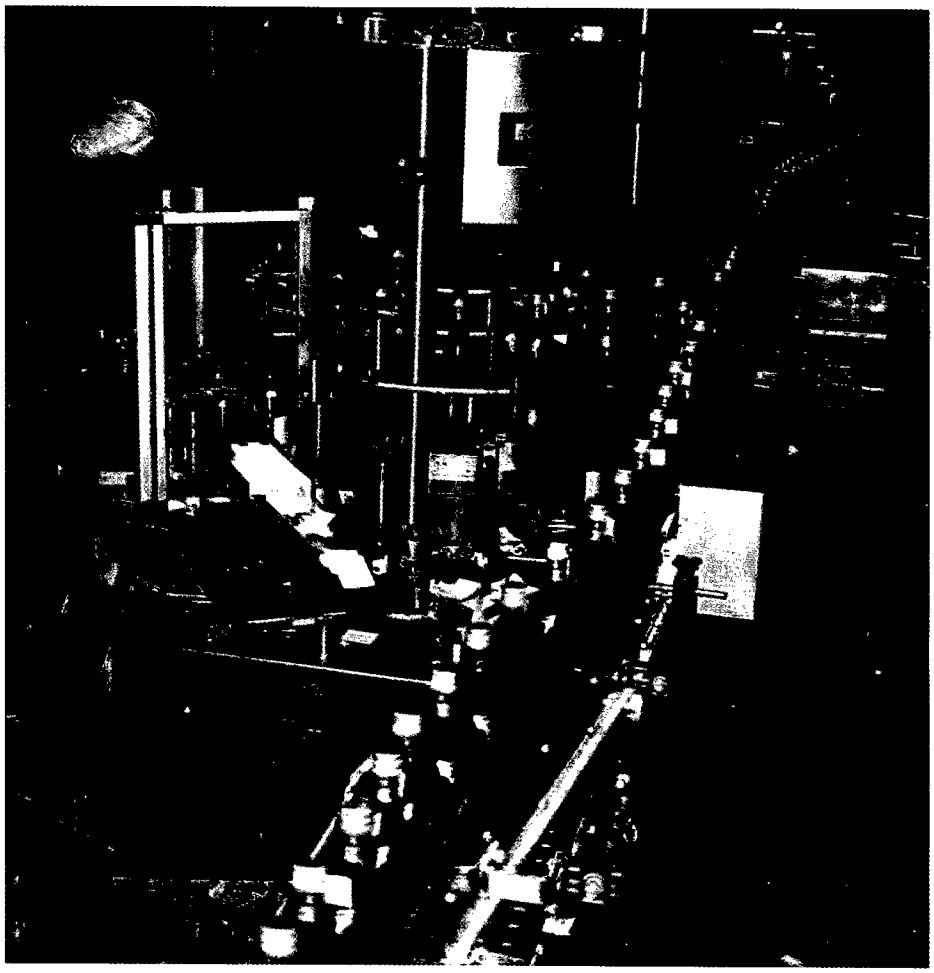

Figure 4. Imported equipment has contributed to increased output for China's food and beverage industries.

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Problems Controlling Investment. Even though Beijing renewed its emphasis on industrial renovation after 1985, local authorities and factory directors have been slow to follow suit; much of the investment labeled technological transformation has actually continued to go into capital construction. In December 1986, for example, China's State Statistical Bureau estimated that the share of funds labeled technological renovation but actually used to construct new capacity had grown from 32 percent to 46 percent in two years. Critics also claim that there has been too much investment in low-priority sectors and in upgrading equipment for processing lower grade goods, while basic industries and the infrastructure have been neglected.

Beijing has taken steps to improve the utilization of funds. For example, in 1987 the China International Engineering Consultancy Corporation was empowered to appraise feasibility studies on all major construction and technical transformation projects. Likewise, in January 1987, China's Investment Consultancy Company—set up in 1986 to appraise projects applying for Bank of China loans—established an expert committee to evaluate investment in the state's key projects and technological transformation efforts. But Chinese economists believe control of

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investment may dissipate if more corporations are set up to manage investment in fields such as energy, transportation, raw materials, agriculture, forestry and manufactured goods—including machinery, electronics, textiles, and light industries—as reforms call for in 1988. Such corporations may be too specialized to compare the merits of projects in different fields. In addition, they will implement projects approved by the State Planning Commission, and thus probably lack independence for approving or rejecting projects.

Beijing will be particularly hard pressed to control locally financed investments, which have expanded greatly over the past four years. China announced recently that tax rates for locally financed investment for new capital construction and technological transformation will be raised to between 10 and 20 percent of value, even within the State plan. Out-of-plan projects will be taxed at 20 percent of value, except for nonproductive projects, which will be taxed at 30 percent. With the booming domestic economy and low tax payment rates, however, these indirect measures are likely to have only a limited effect.

Technical Limitations. Weak indigenous technical capabilities, particularly in electronics, and continuing shortages of skilled personnel to operate more advanced equipment will slow future gains from industrial renovation. China's reliance on microelectronics to upgrade machinery is hampered by the domestic electronics industry's slowness in learning to effectively use sensitive equipment, its inability to turn out commercial quantities of advanced integrated circuits and continuing difficulties—such as export controls and foreign exchange shortages—importing advanced equipment and technology. Redundant research and waste of personnel and materials are slowing China's CAD/CAM efforts, as is the lack of computing power. Chinese research activities lag the West by five to 10 years in the use of modal analysis techniques—critical for producing accurate and reliable machine tools. Efforts to introduce computer-assisted or -controlled manufacturing will also be slow, often requiring reorganization of the shop floor layout and production processes.

We believe that technical upgrading of China's large- and medium-sized enterprises will be particularly slow:

- Ninety percent of larger enterprises have no investment in laboratories and testing equipment; trial manufacturing is carried out on production lines, and quality checks are left to the consumer. One Chinese journal reported that, of the more than 1,270 major enterprises in the machinery industry, only 130 had research departments. 25X1

- Only 20 percent of the engineers and technicians working in state enterprises work on technology development, compared with 60 percent in foreign countries.

- Most major enterprises spend less than 1 percent of total sales on technology, compared with up to 5 percent in Japanese enterprises. For example, one survey showed that only 12 of 75 major enterprises in Guangzhou have established technology development funds. 25X1

- Low depreciation rates of fixed assets inhibit enterprise managers from upgrading technology and equipment. 25X1

Competing Priorities. Probably the most significant obstacle for the technological renovation effort, however, is the leadership's preoccupation with other economic priorities. Despite the rhetoric for emphasizing technological transformation in 1988 (see inset), such admonitions have become, in the words of Chinese economist Ma Hong, "a platitude." Beijing's economic agenda for 1988 instead focuses on management reforms, such as the contract system to link a manager's income to the factory's performance,[3] policies such as bankruptcy, the use of monetary and fiscal policies, trade reform, and experimenting with crucial, but politically sensitive, price reforms. 25X1 25X1

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Rhetoric on the Importance of Technological Transformation in 1988

In statements to the press in early 1988, Ma Hong, Director General of the Economic, Technological, and Social Development Research Center, said the leadership is working on a formal industrial policy to be announced in 1988 to focus attention on technology levels in industry. For the past year, Ma has argued that the policy on reforming the industrial structure should be combined with the technological transformation policy. China's most important enterprises, especially in the eastern coastal areas and the northeast, are too old to serve as the foundation for a modern economy and are deteriorating rapidly, he argues. Therefore, massive infusions of capital for heavy industry and the supporting new technology and equipment should begin immediately.

Premier Li Peng appears to have been echoing these priorities during his work report to the Seventh National People's Congress this spring when he called for speeding the development of basic industries and infrastructure.

In late 1987, Zhu Rongji, then Vice Minister of the State Economic Commission, said outmoded equipment and inefficient management are the major obstacles to developing industry, and that upgrading enterprise technology will be a priority in 1988. Zhu called on all departments to draw up plans, policies, and regulations to improve management of technical work and provide information on domestic and foreign technical developments to enterprises.

Chinese commentaries subsequently called 1988 a crucial year for ensuring success in upgrading industrial enterprises. An article in People's Daily *acknowledged that, compared with economic structural reforms, the momentum and progress of technical advance in enterprises has obviously lagged. The commentary said now is the time to attach great importance to technical renovation and to stress that the achievements of economic reform should be reflected in the technical progress of enterprises.*

The visibility of technical transformation at the national level is further reduced by the decentralization of enterprise management and industrial renovation projects, which leaves the search for workable solutions to lower-level officials. Beijing's unbalanced approach to its economic needs could further slow technical renovation efforts:

- The implementation of the contract system—which allows the use of bank loans and retained profits to upgrade industrial technology—could work against technological upgrading if contract terms fail to give managers adequate incentives for investing in new equipment and technology. Chinese officials have issued guidelines that call for contracts to stipulate the targets for industrial renovation, evaluate appreciation of fixed assets, set standards for grading enterprise managers, and provide guidelines for an evaluation of managers' efforts in plant modernization, but enforcement of these guidelines remains a question. 25X1

- The export-led coastal development strategy, announced by Party Secretary Zhao Ziyang in early 1988, may draw attention away from technical renovation, making industrial upgrading even more difficult in interior and western regions. For example, the export-led strategy stresses the acquisition of raw materials through imports, rather than through upgrading domestic industry and infrastructure. The export-led strategy also increases competition for capital and skilled people, possibly pulling them away from industries in the interior. 25X1

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Longer Term Costs of Neglecting Industrial Renovation

China's inability to solve these fundamental development problems could have a great economic and political cost for China, because it limits the progress of the leadership's priority reform efforts at a time when the reform program is stalled and searching for

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an avenue to show progress in the urban industrial economy. In general, we think the costs of a sluggish industrial renovation program are these:

For Managerial Reform and the Contract System. In the absence of technological upgrading, the contract system and similar managerial innovations are more likely to have limited, one-time benefits. Numerous accounts in the Chinese press suggest that without technological innovation, factories adopting management reforms show only temporary growth, while firms that combine management reforms with technology renovation programs are far more successful in sustaining good performance. For example, a paper mill received its first new equipment in 26 years after its new manager, operating under contract, used retained profits to fund 71 upgrading projects; the percentage of quality products meeting national standards subsequently rose from less than 7 to over 75. Similar success was reported when metallurgy firms under the contract system used 60 percent of retained profits for technical upgrading and new product development.

For the Export-Led Coastal Development Strategy. The technical levels of coastal areas—even though generally better than elsewhere—are still low, and in many cases will obstruct export-led growth. China is counting on exports from coastal provinces to generate foreign exchange to pay for imports of needed agricultural goods, raw materials, and capital goods but more industrial renovation is needed to support these goals. Although officials originally stressed making full use of China's abundant manpower by developing labor-intensive export-processing industries in coastal areas, officials are increasingly acknowledging the importance of upgrading technology and including knowledge-intensive industries in the coastal development strategy.

For China's International Trade. Continued technical renovation will be needed for China's traditional industries to satisfy domestic needs and meet goals for expanding exports. Textile industry officials, for example, say more flexible manufacturing systems are needed to increase exports of finished textile products. The machine-building, metallurgy, and chemical industries also are counting on new technology for improvements in quality and capacity needed to export more products, particularly those with a higher value added. Although China is limiting imports of selected categories of machinery, purchases of foreign equipment will remain an important means of upgrading the traditional industries

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For Economic Development. Slow progress in renovating traditional industries makes it likely that this large component of industry will continue to be a drag on overall economic performance and modernization. The rate of increase in Chinese industrial output—though impressive—has been outpaced by demand, and shortages of raw materials are slowing industrial development. A national industrial survey released in February 1988 said the energy and raw materials industries remain weak links in economic development while processing industries are developing too rapidly. Heavy and light industrial growth is straining domestic supplies of raw materials. For example, in 1987 processing industries grew 17.3 percent, while the raw materials industry increased only 13.1 percent. And despite energy production gains in recent years, energy shortages continued to idle about 30 percent of China's industrial production capacity, according to August 1988 Chinese press reports.

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Finally, technologically backward enterprises will continue to drain the state's budget, undermining the progress of the economic reform program and limiting overall economic growth. Reducing the number of deficit state enterprises is even more important with price reforms moving slowly. With no way to pass the higher cost of wages, bonuses, and raw materials on to the consumer, technical improvements are one of the few options for increasing productivity and profit.

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